A.35 Heckard's Pepper-Grass (*Lepidium latipes* var. *heckardii*)

A.35.1 Legal Status

Heckard's pepper-grass (*Lepidium latipes* var. *heckardii*) is not listed under either federal or California Endangered Species Acts. Its Heritage Ranking in the California Natural Diversity Database (CNDDB) is G4T1/S1.2 which means that the species as a whole is apparently secure across its overall distribution, but some factors of concern, such as narrow habitat requirements or continuing threats, do exist. In contrast, this particular variety of the species has been ranked as threatened globally (G) and within the state (S) because it has either fewer than six viable occurrences, fewer than 1,000 individuals, or fewer than 2,000 acres of occupied habitat. Its state threat level rank is "threatened."

The California Native Plant Society (CNPS) List ranking of 1B.2 for Heckard's pepper-grass indicates that it is rare, threatened, or endangered in California and elsewhere, and is considered by CNPS to be fairly endangered in California with between 20 to 80 percent of occurrences threatened. Plants with a List rank of 1B are considered by the California Native Plant Society to meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the California Fish and Game Code.

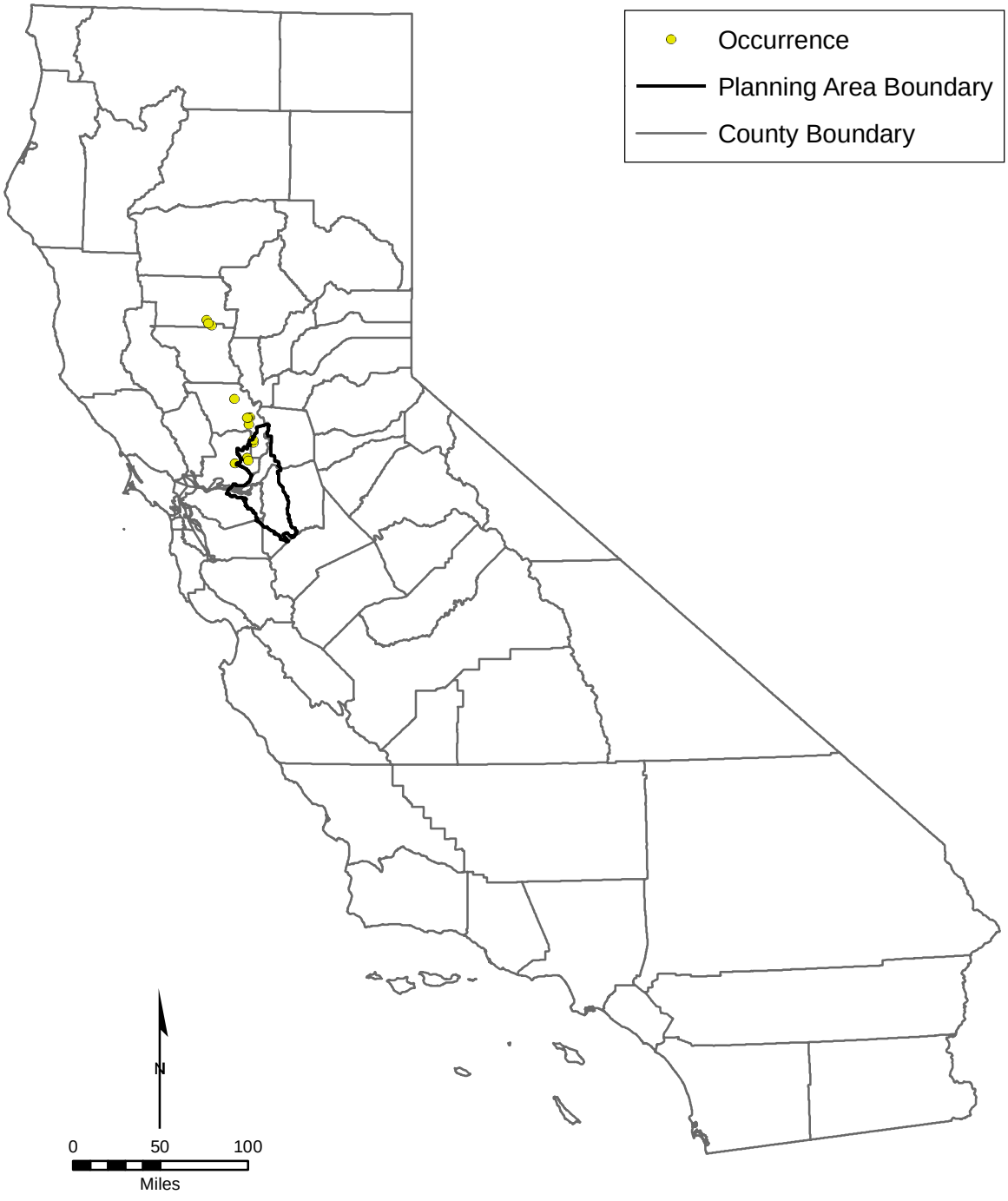
A.35.2 Species Distribution and Status

Range and Status

The reported range of Heckard's pepper-grass extends from Glenn and Colusa counties in the north, to Solano County in the south (Figure A.35.1) (CNDDB 2008). The distribution of this species includes the alkaline soil areas to the southeast and south of the City of Woodland and at the DFG Tule Ranch Reserve in Yolo County (Showers 1996, Witham 2003, CNDDB 2008). Populations of Heckard's pepper-grass at the Tule Ranch site are sparse but dispersed throughout the site (Witham 2003). In Solano County, Heckard's pepper-grass has been reported from the East Wilcox and Gridley ranches in the greater Jepson Prairie area (Witham 2006, CNDDB 2008) and along Haas Slough, but that occurrence was last observed by Jepson in 1891 (Consortium of California Herbaria 2008). Aerial imagery indicates that Haas Slough occurrence is likely to have been extirpated by the spread of intensive agriculture along both sides of the slough. Although occurrences have been recently discovered, Heckard's pepper-grass is extremely rare in California (CalFlora 2000, CNPS 2008) and is expected to continue to decline, although data on population trends are lacking.

Distribution and Status in the Planning Area

Heckard's pepper-grass has recently been observed in the BDCP Planning Area west of Yolo Bypass in Yolo County in the area of the Tule Ranch Reserve (Witham 2003, CNDDB 2008), and in Solano County on the Wilcox and Gridley ranches of the greater Jepson Prairie area (Figure A.35.2) (Witham 2006). The hydrology and vegetation of the Gridley Ranch site is described in Williamson et al. (2005). The occurrences in the BDCP Planning Area are within vernal pool grasslands on clay-rich alkaline soils that have not been intensively farmed.



Source: California Department of Fish and Game, CNDDB, 2008.
Consortium of California Herbaria, 2008.

Figure A.35.1. Heckard's Peppergrass Statwide Recorded Occurrences

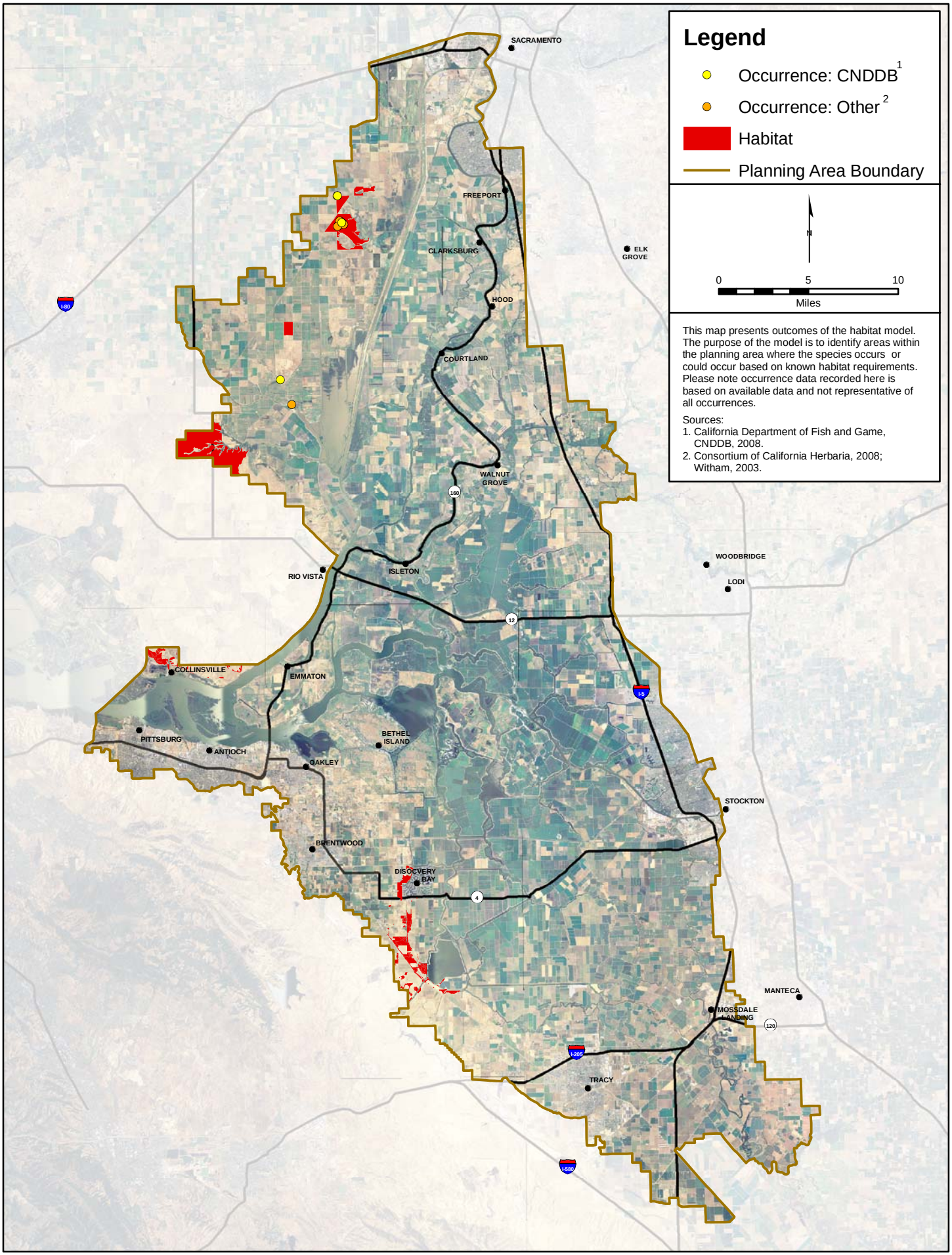


Figure A.35.2. Heckard's Peppergrass Habitat Model and Recorded Occurrences

A.35.3 Habitat Requirements and Special Considerations

Very little is known regarding the ecology of Heckard's pepper-grass. Populations near the City of Woodland occur on alkaline flats and mesic alkaline grasslands that were once contour rice fields on Pescadero silty clay, saline-alkali, Marvin soils, and Willows clay soil types. On the Tule Ranch site in the Yolo Bypass, and on the East Wilcox and Gridley ranches in Solano County it occurs in grazed, slightly alkaline vernal pool grassland in areas that are dominated by annual ryegrass (*Lolium multiflorum*) (Witham 2006, CNDDB 2008), a non-native that is tolerant of alkaline soils (Dawson et al. 2007). Occurrence records and survey reports suggest that Heckard's pepper-grass is closely associated with Sacramento Valley populations of alkali milk-vetch (*Astragalus tener* var. *tener*) (a covered species) (CNDDB 2008).

A.35.4 Life History

Heckard's pepper-grass is a three- to 25-cm tall herbaceous annual plant in the mustard family (Brassicaceae). It is differentiated from dwarf pepper-grass (*L. latipes* var. *latipes*) based on its height, the distance between its leaf nodes, and its lack of a basal rosette (Hickman 1993, Rollins 1993). Heckard's pepper-grass has dense foliage with five to 10 cm long linear leaves. Small, greenish flowers occur in dense spikes and the flat, oval fruits are deeply notched at the top (Hickman 1993, Rollins 1993). Heckard's pepper-grass flowers March through May (CNPS 2008). Studies are needed to shed light on basic biological and ecological requirements such as pollination systems, seed dormancy and germination cues, dispersal vectors, and seed predation.

A.35.5 Threats and Stressors

Development, waterfowl management, agricultural conversion, urban development, and exotic plant species are considered the primary threats to Heckard's pepper-grass (Showers 1988, Showers 1996, Dawson et al. 2007, CNDDB 2008). All of these threats lead to the loss of habitat or the degradation of conditions the plant requires to survive.

A.35.6 Relevant Conservation Efforts

The known populations of Heckard's pepper-grass in Solano County are under conservation easements and those in Yolo County are protected on the DFG Tule Ranch Reserve or by a conservation easement in the Spring Lakes area near the City of Woodland. The Tule Ranch and greater Jepson Prairie area populations are currently grazed.

Heckard's pepper-grass is proposed for coverage under the Solano County Habitat Conservation Plan (HCP) and the Yolo County HCP/Natural Community Conservation Plan.

A.35.7 Species Habitat Suitability Model

Habitat. Heckard's peppergrass habitat was identified as Natural Seasonal Wetlands and Grasslands on Antioch (AoA), Capay (Ca, Cc), Clear Lake (Ck), Diablo (DaC), Hillgate (HcA), Marcuse (Mb, Mc, Sb), Marvin (Mf), Pescadero (Pc, Pk), Rincon (Rg), Scribner (245), and Solano (Sh, Sk) soils. Vegetation types designated as species habitat in this model correspond to the mapped vegetation associations in the BDCP GIS vegetation data layer. Aerial imagery (USDA 2005) and LiDAR elevation data (DWR 2007) were used to determine how intensively parcels included in the model had been farmed as the vegetation data included significant areas of fallow agricultural land that had been misclassified by DFG as various classes of natural vegetation. Parcels without natural vernal pool and swale vegetation signatures and

microtopography were deleted from the area of predicted habitat. Additionally, parcels with known occurrences were digitized and included as habitat.

Assumptions. Historical and current records of this species in the BDCP Planning Area indicate that its current distribution is limited to alkaline soil areas with vernal pool and swale microtopography along the northeastern border of the BDCP Planning Area (Figure A.35.2) (Witham 2002, 2003, 2006, CNDDB 2008). Because Heckard's peppergrass also frequently occurs in the same habitats as Alkali milk-vetch (Witham 2002, 2003, 2006, CNDDB 2008), its habitat range was extended in the central-western and southwestern portions of the BDCP Planning Area to match that of alkali milk-vetch. The vegetation cover of the alkaline soils is typically a combination of vernal pool adapted species and annual ryegrass (Witham 2002, 2003, 2006, CNDDB 2008).

A.35.8 Recovery Goals

A recovery plan has not been prepared for this species and no recovery goals have been established.

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